

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte JOONG-HA YOU

Appeal No. 2002-0579
Application No. 09/324,780

ON BRIEF

Before ABRAMS, FRANKFORT and BAHR, Administrative Patent Judges.
BAHR, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1-14 and 20-24, which are all of the claims pending in this application.¹

¹ Appellant's amendment after final (Paper No. 12) was refused entry by the examiner (see advisory action, Paper No. 13).

BACKGROUND

The appellant's invention relates to a semiconductor package. A copy of the claims under appeal is set forth in the appendix to the appellant's brief.

The examiner relied upon the following prior art references in rejecting the appealed claims:

Johnson et al. (Johnson)	5,969,947	Oct. 19, 1999 (filed Dec. 17, 1997)
Williams et al. (Williams)	6,043,125	Mar. 28, 2000 (filed Nov. 10, 1997)
Oppermann et al. (Oppermann)	6,093,971	Jul. 25, 2000 (filed May 2, 1997)

The following rejections are before us for review.

- (1) Claim 24 stands rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.
- (2) Claims 1, 2, 4, 7, 8, 10 and 20-23 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Oppermann.
- (3) Claims 5, 6, 11 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Oppermann.
- (4) Claims 3 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Oppermann in view of Williams.

(5) Claims 13 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Oppermann in view of Johnson.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the above-noted rejections, we make reference to the answer (Paper No. 17) for the examiner's complete reasoning in support of the rejections and to the brief and reply brief (Paper Nos. 16 and 18) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by the appellant and the examiner. As a consequence of our review, we make the determinations which follow.

The written description rejection

The basis of the examiner's rejection of claim 24 under the first paragraph of 35 U.S.C. § 112 is that the application as originally filed does not provide written descriptive support for the limitation "*non-conductive* filling material" in claim 24, which was first presented in the amendment filed November 21, 2000 (Paper No. 10). The examiner is correct, and appellant does not dispute, that the application as originally filed contains no explicit reference to a "non-conductive" filling material as is now recited

in claim 24. However, the test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter, rather than the presence or absence of literal support in the specification for the claim language. See Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1116-17 (Fed. Cir. 1991) and In re Kaslow, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983). For the reasons which follow, we are satisfied that, despite the lack of literal support in the specification for the claim language “non-conductive filling material,” the disclosure of the application as originally filed reasonably conveys to one of ordinary skill in the semiconductor packaging art that the epoxy resin filling material 31 is non-conductive. Accordingly, we shall not sustain the rejection.

First, in discussing the instant invention, appellant’s specification discloses on page 5 “a filling material for *sealing* the first openings” (emphasis ours). From our perspective, one skilled in the semiconductor packaging art would understand the term “sealing” in this context to mean sealing or insulating from electrical conduction and would thus infer that the disclosed filling material is non-conductive. Moreover, it is apparent from the disclosure of the fabrication process (see especially page 8, lines 16-25, and Figures 6C and 6D) that the space A formed by the opening in the polyimide film 24 is necessary to provide access for a bond tool to the chip attaching portion 26 of

the Cu pattern 25 to bond the chip pad 22 to the chip attaching portion and not for an external terminal connection, as in the case of the opening in the film 24 for the external terminal attaching portion 27. Against this background, one skilled in the semiconductor packaging art would understand the “filling material such as an epoxy resin” (specification, page 8) disclosed in appellant’s specification to be an electrically insulating or non-conductive material.

The prior art rejections

Claims 1-6 and 20

Appellant has not offered any argument as to the patentability of these claims over the prior art applied by the examiner, choosing instead to argue that the amendment after final (Paper No. 12), which was refused entry by the examiner and which proposed to cancel claim 1 and amend claims 2-6 and 20 to depend from claim 24, should be entered (brief, pages 22-23). The refusal of an examiner to enter an amendment after final rejection of claims is a matter of discretion and is not reviewable by the Board of Appeals. Rather, such an issue should be addressed by a petition under 37 CFR § 1.181 to the Commissioner, as set forth in 37 CFR § 1.127. See also In re Mindick, 371 F.2d 892, 894, 152 USPQ 566, 568 (CCPA 1967); In re Hengehold, 440 F.2d 1395, 1403, 169 USPQ 473, 479 (CCPA 1971). In the absence of any argument as to why claims 1, 2, 4 and 20 are not anticipated by Oppermann, why claims 5 and 6 are not unpatentable over Oppermann or why claim 3 is not

unpatentable over Oppermann in view of Williams, we have no choice but to summarily sustain the examiner's rejections of these claims.

Claims 7-12 and 21-23

Oppermann (see Figures 17-20) discloses a chip module comprising a chip carrier 76, conductor path structure 83 including a plurality of conductor paths 82 each having a chip bonding region 89, rod conductor 87 and circular flat conductor 88, an orifice 90 in the chip carrier 76 exposing the chip bonding region, a recess 91 in the chip carrier 76 exposing the circular flat conductor 88 and a chip 75 bonded to the conductor path structure at chip bonding regions 89 of the conductor paths 82. As disclosed in column 12, lines 26-34,

[a] particular advantage of the connecting construction shown in FIGS. 17 to 20 is that both the recess 91 and the orifice 90 in the chip carrier 76 can be filled with connecting material 95 in one and the same process step so, on the one hand, external bonding bumps 96 are created for the external attachment face arrangement 80 of the chip carrier 76 and, on the other hand, internal connections 97 between the wafer 73 or the chips 75 formed coherently thereby and the chip carriers 76 are created.

We, like appellant, understand the "connecting material 95" disclosed by Oppermann to be a conductive material. However, we do not agree with appellant (brief, page 17) that the presence of conductive filling material, rather than non-conductive filling material, in Oppermann's orifices and recesses constitutes a distinction between the subject matter of claims 7-12 and 21-23 and Oppermann's chip module. Simply stated, claims 7-12

and 21-23 do not require that the “filling material that covers the first regions over the attached corresponding chip pads” be non-conductive. It is well established that limitations not appearing in the claims cannot be relied upon for patentability. In re Self, 671 F.2d 1344, 1348, 213 USPQ 1, 5 (CCPA 1982). Moreover, limitations are not to be read into the claims from the specification. In re Van Geuns, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993) citing In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

Appellant’s sole argument as to why claims 7, 8, 10 and 21-23 are not anticipated by Oppermann and claims 11 and 12 are not unpatentable over Oppermann is that Oppermann fails to disclose a filling material which is non-conductive that covers the first regions. It should be apparent from the above discussion that this argument is not commensurate with the scope of claims 7, 8, 10-12 and 21-23 and thus does not persuade us of any error in the examiner’s rejections of claims 7, 8, 10 and 21-23 as being anticipated by Oppermann and claims 11 and 12 as being unpatentable over Oppermann. These rejections are thus sustained. With respect to the combination of Oppermann and Williams, appellant’s only argument (brief, page 18) is that Williams fails to cure the perceived deficiencies (i.e., failure to disclose non-conductive filling material that covers the first regions) of Oppermann. In that claim 9 does not require a non-conductive filling material, as discussed above, this argument is not persuasive of

the nonobviousness of the subject matter recited in claim 9. Accordingly, the rejection of claim 9 as being unpatentable over Oppermann in view of Williams is also sustained.

Claim 13

We turn now to the examiner's rejection of claim 13, which depends from claim 7 and further recites that the filling material is an epoxy, as being unpatentable over Oppermann in view of Johnson. We understand the examiner's position to be that it would have been obvious to one of ordinary skill in the art at the time of appellant's invention to use a conductive epoxy material as the "connecting material 95" of Oppermann, as conductive epoxies were well known in the chip package art at the time of appellant's invention for making electrical connections on chip packages as evidenced by Johnson (column 1, line 45). This position seems eminently reasonable to us.

Appellant offers two arguments in favor of the patentability of claim 13 over the combination of Oppermann and Johnson. The first argument, which is that "Johnson specifically describes an epoxy that is conductive" (brief, page 20), appears to be based on the premise that claim 13 requires a non-conductive filling material. In that claim 13 contains no such limitation, this argument is not well taken. Appellant's second argument is that the use of the conductive epoxy of Johnson as the filling material 37 of Oppermann (see Figure 1) would render the area between the conductor path and the contact metallizations conductive and thus "would destroy the functioning of the chip

module of Oppermann, as information to be transmitted off the chip would not have separately identifiable paths” (brief, page 20). While this may be true, appellant’s argument is not directed to the modification which we understand to have been proposed by the examiner, namely, using conductive epoxy as the “connecting material 95.” Appellant’s expressed concerns with regard to destruction of separately identifiable paths do not apply to such use of a conductive epoxy material. We perceive no error in the examiner’s proposed combination of Oppermann and Johnson and, thus, shall sustain the rejection of claim 13.

Claim 14

Turning finally to the rejection of claim 14, which depends from claim 7 and further recites that the external terminal is a solder ball, the examiner’s position appears to be that it would have been obvious to one skilled in the art at the time of appellant’s invention to use a solder ball in fabricating the external bonding bumps 96 of Oppermann’s chip module, in light of the teaching by Johnson that solder balls were well known at the time of appellant’s invention for forming electrical terminals (column 1, line 44; column 4, lines 7-8). Appellant (brief, pages 21-22) argues that Johnson does not disclose or suggest using the solder balls as external terminals as recited in claim 14 and, further, that the use of a solder ball in forming the external bonding bumps 96 of Oppermann would not permit filling of both the recess 91 and the orifice 90 in one

and the same process step (see column 12, lines 26-34) and thus would not have been obvious. For the following reasons, neither of these arguments persuades us of error on the examiner's part. Thus, we shall sustain the examiner's rejection of claim 14.

As for appellant's first argument, the various considerations in fabrication of terminals between chips and chip carriers and between chip packages and printed circuit boards are not of such a nature as to discourage the use of the same type of terminal fabrication in both applications. Further, as evidenced by Johnson in column 4, lines 7-8, the use of solder balls or ball grid arrays 220 (see Figure 2B) for external terminals on chip packages was well known in the art at the time of appellant's invention and would, thus, have been an obvious choice for one of ordinary skill in the art in fabricating the external bonding bumps 96 of Oppermann.

As for appellant's second argument, we do not share appellant's view that the use of a solder ball in fabricating the external bonding bump 96 of Oppermann would not permit the use of a single process step for filling both the recesses and orifices, as disclosed by Oppermann. Solder balls could, for example, be placed in the recesses and orifices and heated in a single reflow process step to bond the solder material to the conductive paths 82.

CONCLUSION

To summarize, the decision of the examiner is affirmed as to claims 1-14 and 20-23 and reversed as to claim 24.

No time period for taking any subsequent action in connection with this appeal
may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

NEAL E. ABRAMS
Administrative Patent Judge

CHARLES E. FRANKFORT
Administrative Patent Judge

JENNIFER D. BAHR
Administrative Patent Judge

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